National Aeronautics and Space Administration

Investigation of FGF23 in Bed-Rest and Space Fligh

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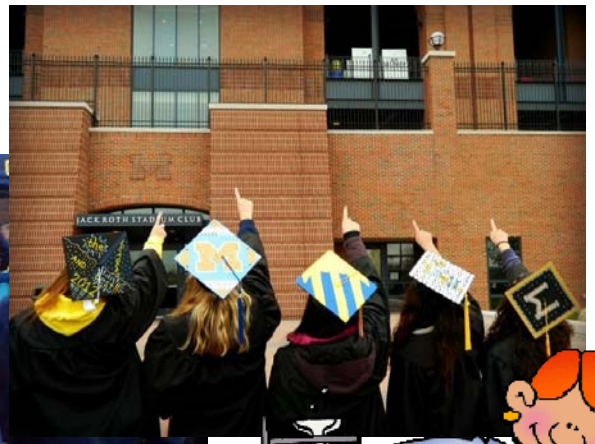
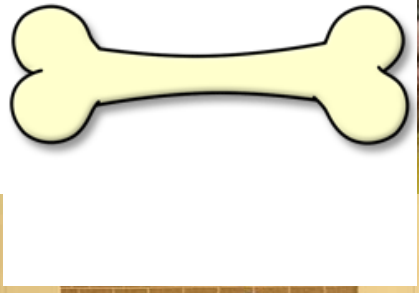
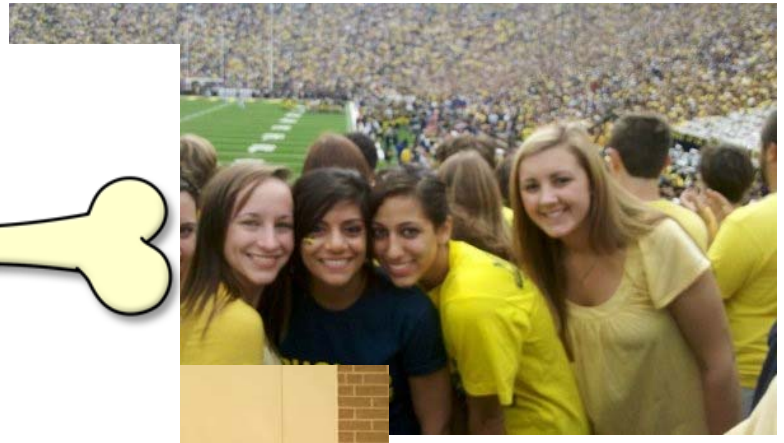
Introduction





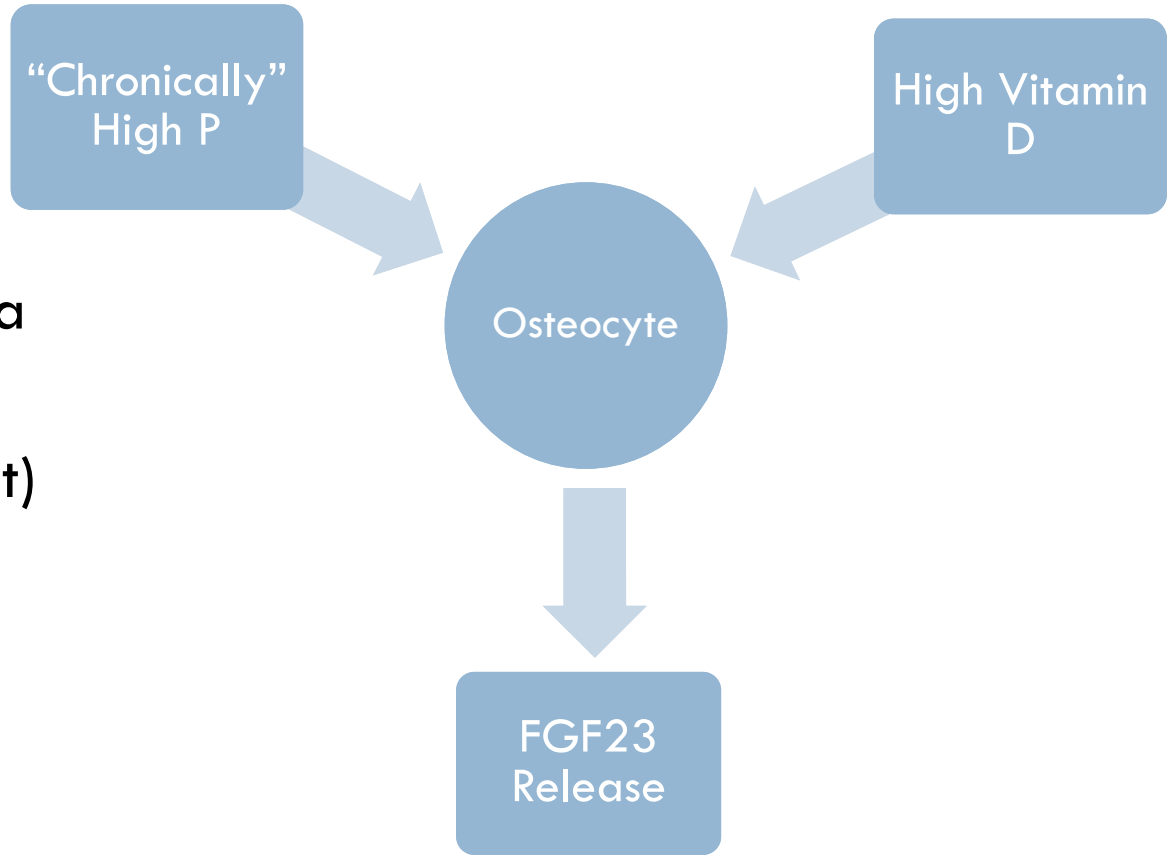


Objectives of Internship

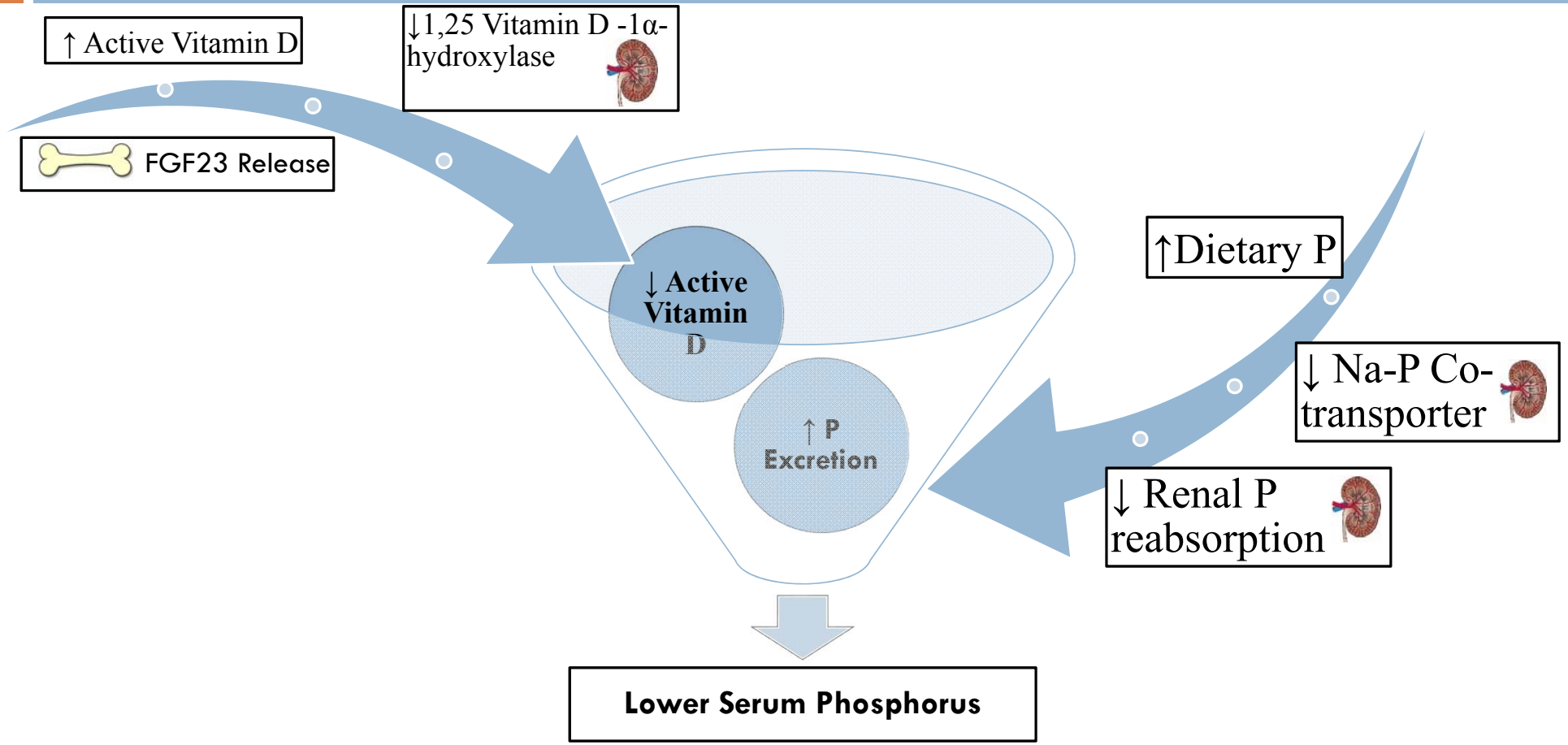
- To study the changes in FGF23 during Bed rest and Space Flight
- Proposal and acquisition of funding prior to internship

Background

- P is stored in bone like Ca
- High P:Ca in astronaut diet (but not bed rest diet)
- Low active Vitamin D levels in astronauts



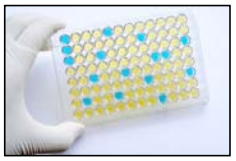
The FGF23 Story



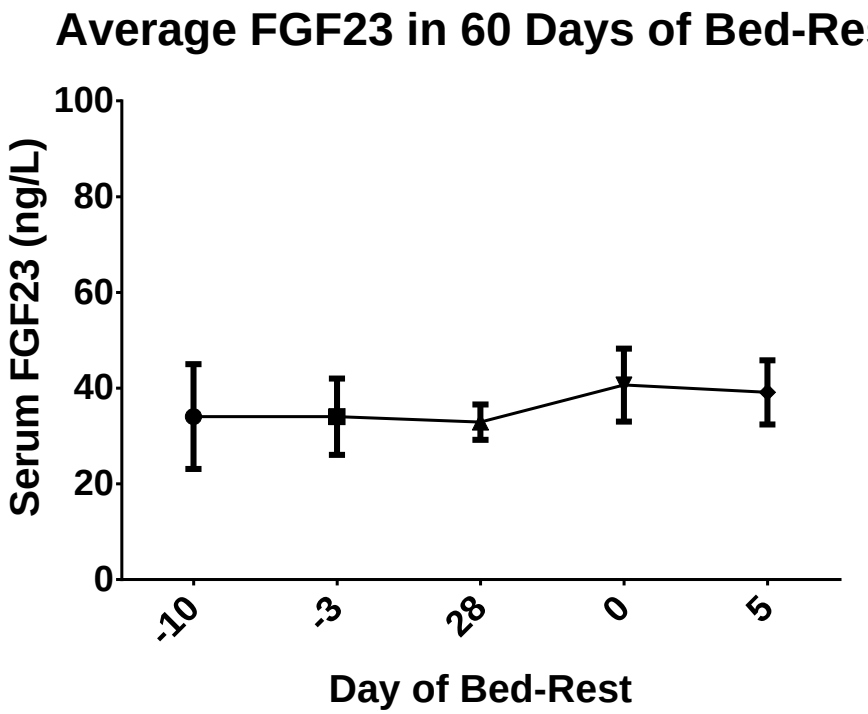
Risks

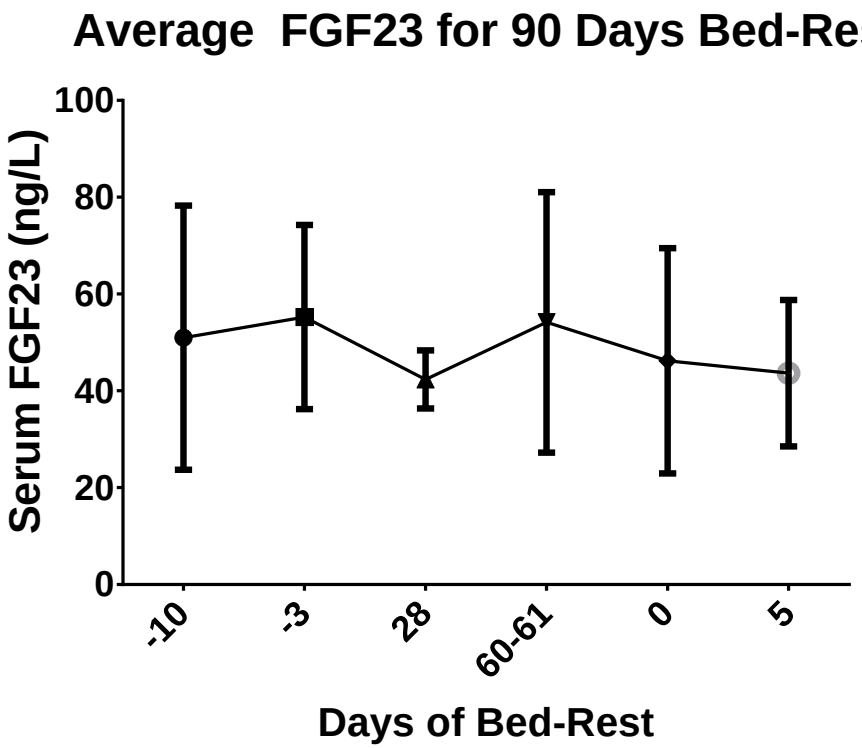
- Low Vitamin D status
- Low Calcium levels
- Demineralization
- Does this play a role in space flight related bone loss?
- Does this contribute to kidney stone risk?

Methods

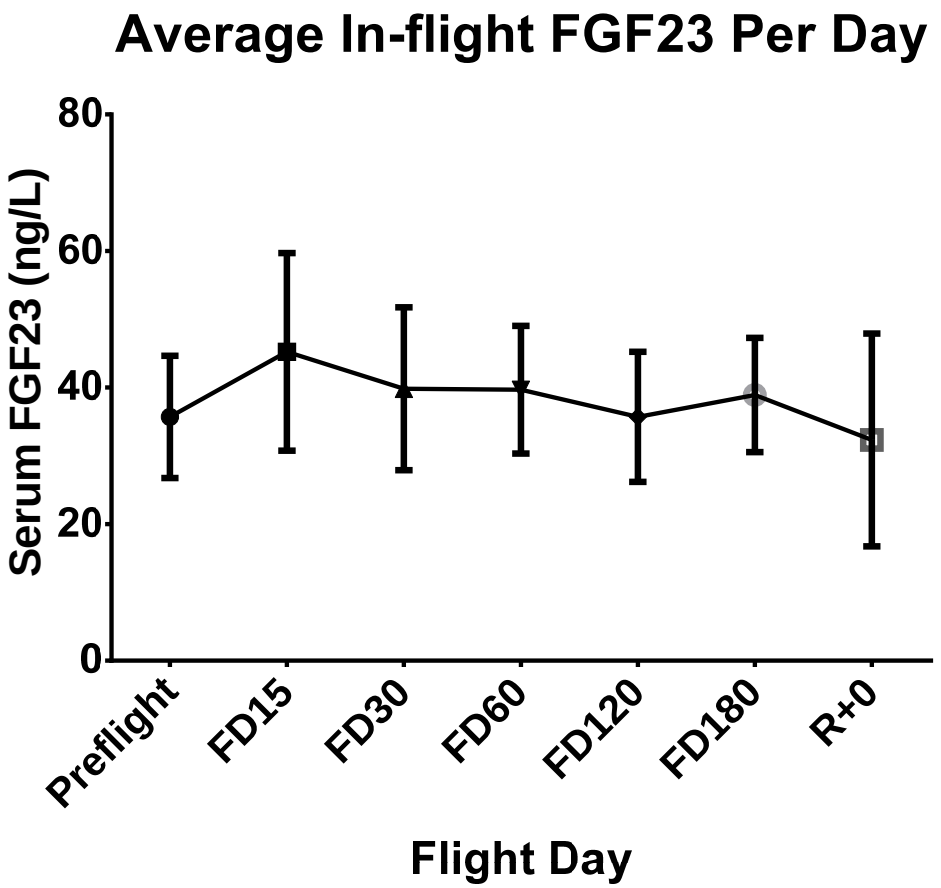
- Serum samples were run using the intact FGF23 ELISA kit, iFGF23, from Kainos lab in Japan 
- The collected FGF23 data was compared to the database of information on each of the test subjects

Bed-Rest Results





Flight Data Results



Discussion

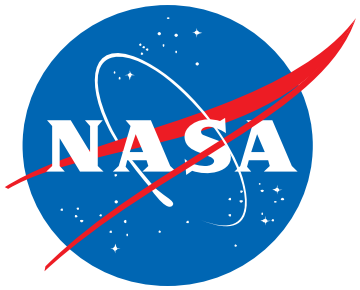
- Compared FGF23 to:
  - Vitamin D intake
  - Phosphorus intake and excretion
  - Phosphorus:Calcium Ratio in diet
  - Parathyroid hormone

- Initial glance at the results
  - Changes in flight appeared more variable than bed-rest, likely related to bed rest diet consistency

Summary

- The purpose of my project was to determine the effect of disuse situations, such as space flight, on serum FGF23

- To do this I learned how to:
  - Proposal writing
  - Learning how to run a new assay
  - Graph out relationships between collected FGF23 data and existing data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